

Assessment of the Impact of Climate change on Irrigation Systems in the Lao PDR

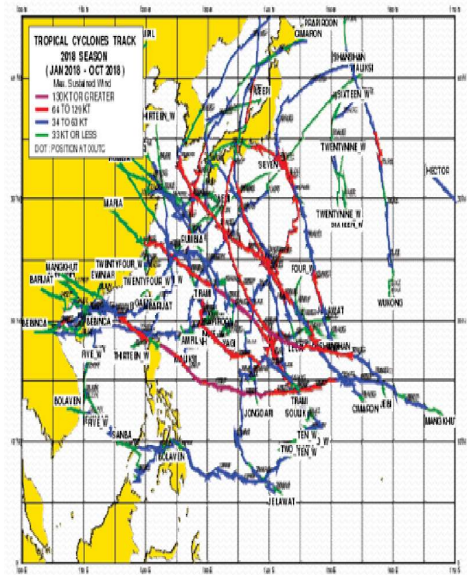
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Outline

- ☐ Introduction
- ☐ Objective
- ☐ Scope
- ☐ Overview of irrigation in Laos
- ☐ Impact of climate change on irrigation
- ☐ Conclusion
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Introduction

- Scientists are in agreement that the world's climate is changing. Average temperatures are increasing and extreme events such as storms, floods and droughts occur more frequently.
- **Laos** is highly climate-vulnerable, because our country is a developing country, geographical location, low incomes and limited capacity for adaptation of climate change.



Tropical cyclone tracks
Source: LDMH 2018

Introduction (cont.)

- In 2018, there were around 30 tropical cyclones in the Northwest Pacific Ocean
- and the South China Sea and although Laos is a landlocked country it was directly and heavily impacted by two cyclones, SON-TINH and BEBINCA. It lashed the middle and northern parts of Laos during July and August 2018 including flooding, flash floods and impacts on the irrigation systems, paddy fields, landslide, houses, people, animals and the environment.



❖ General impacts

- 125 districts
- 2,433 villages
- 133,382 families
- 649,493 people
- Died : 26 people
- Hurt : 2
- 1,520 houses was collapse 100%
- etc.



Sources : NDMC 2018

The list of tropical cyclone name over Western North Pacific in 2018

(Source: LDMH 2018)

Month	TC Number	TC Name	Contributed by	Total
Jan	1	BOLAVEN	Lao PDR	1
Feb	2	SANBA	Macao, China	1
Mar	3	JELAVAT	Malaysia	1
Jun	4	EWINIAR	Micronesia	4
	5	MALIKSI	Philippines	
	6	GAEMI	RO Korea	
	7	PRAPIROON	Thailand	
Jul	8	MARIA	U.S.A	5
	9	SON-TINH	Viet-Nam	
	10	AMPIL	Cambodia	
	11	WUKONG	China	
Aug	12	JONGDARI	PDR Korea	8
	13	SHANSHAN	Hong Kong, China	
	14	YAGI	Japan	
	15	LEEPI	Lao PDR	
	16	BEBINCA	Macao, China	
	17	RUMBIA	Malaysia	
	18	SOULIK	Micronesia	
	19	CIMARON	Philippines	
Sep	20	JEBI	RO Korea	4
	21	MANGKHUT	Thailand	
	22	BARIJAT	U.S.A	
	23	TRAMI	Viet-Nam	
Oct	24	KONG-REY	Cambodia	2
	25	VICENTE		
Nov	26	YUTU	China	3
	27	TORAJI	PDR Korea	
	28	MAN YI	Hong Kong, China	
Dec	29	USAGI	Japan	1
		Tropical Depression		
Total (as December 2018)				30

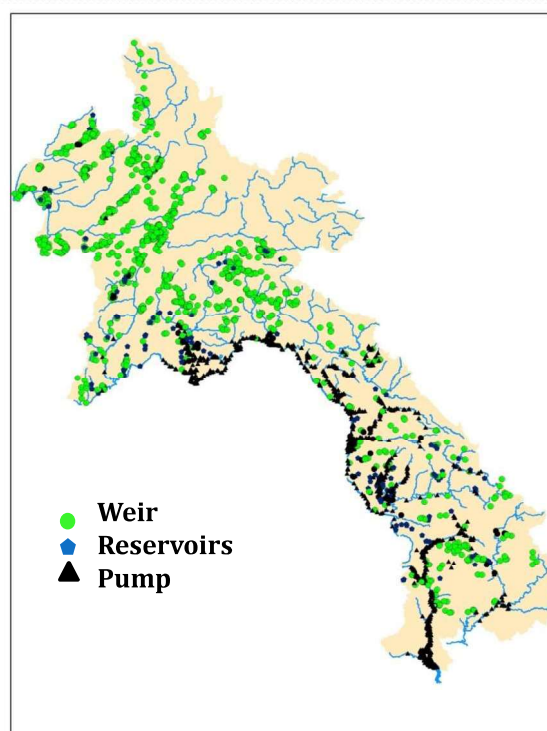
Scope

- Overview of irrigation in Laos
- Impacts of climate change on irrigation in 2018
- Irrigation water management
- Measures for short and long terms on irrigation

Overview of irrigation in Laos

- The total of existing irrigation projects in Lao PDR, there are 15,119 projects including the communities irrigation
- 13,393 Gravity systems
- 1,726 Pumping systems
- 286,442 ha All Irrigated Area.

Source : DOI 2018



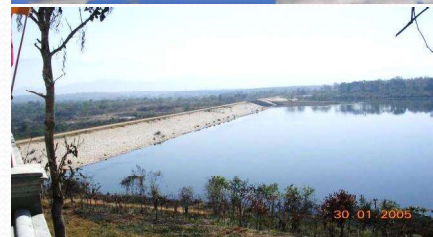
Scale of irrigation in Laos

Small scale	Medium scale	Large scale
>10 -100 ha	>100 -1,000 ha	> 1,000 ha



Community irrigation

< 10 ha



9

Impact climate change on irrigation

- According to the reports of 18 PAFOs of Laos in 2018, the total of plan paddy field area was 817,800 ha ,
- but for the implementation area only 768,410 ha,
- flood paddy field area 101,041 ha and damaged area 66,018 ha. about 8% of implementation area .



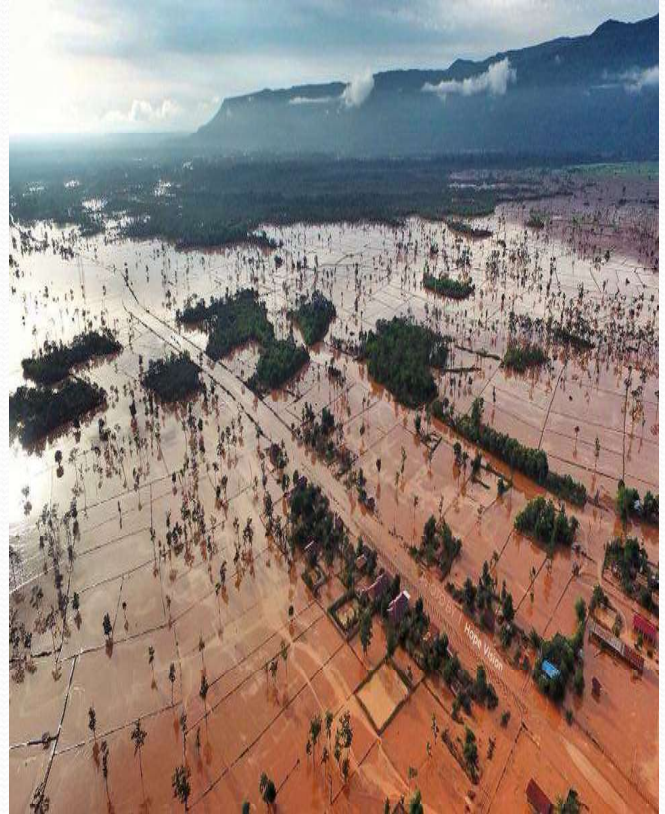
- **Northern part** is more impact (4 provinces):
- (Oudomxai, Phongsaly, Louang Nam Tha and Houaphan provinces)
- Total paddy field area 110,851 ha.
- 4,740 ha was flood area
- **4,045 ha** was damaged area about equalled **3.65%** of total paddy field area in the Northern part.



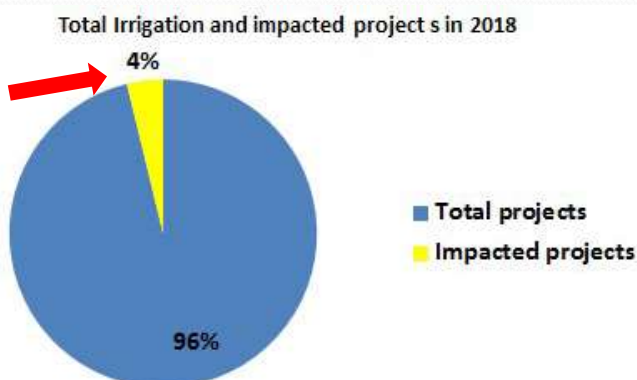
- Medium part of Laos (Bolikhamxai, Khammouan and Savannakhet provinces,
- 447,734ha of total paddy field area
- 78,259 ha was flood area
- damaged area about **50,410 ha**, equalled **11.26%** of total paddy field area in the Medium part of Laos.



- Southern part of Laos , especially Champasak and Attapue provinces which got more impact ,
- Total paddy field area is 209,805 ha ,
- flood paddy field area was 18,042ha,
- **damaged area about 11,563 ha, equalled 5.51%** of total paddy field area in the Southern part of Laos.



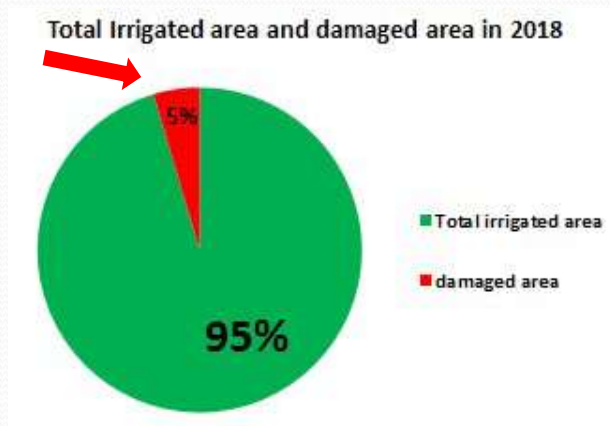
- Impacts on irrigation systems 2018 .
 - Total : 15,119 projects
 - Impacted : **597** projects



- Damages of irrigated area

- Total irrigated area : 286,422 ha

- Damaged area: **13,810 ha**



Summary of damages from impacts of climate change on irrigation systems in 2018

Item	Parts	Projects	Total area (ha)	Impacted area (ha)	Cost estimated (LAK)			
					Headworks	Canals	Ohters	Total
1	Northern part	284	4,882.00	2,181.00	23,484,765,151.00	32,483,721,865.00	12,925,943,822.00	68,894,430,838.00
2	Middle part	235	671.00	-	5,740,000,000.00	4,470,000,000.00	39,472,933,880.00	49,682,933,880.00
3	Southern part	78	8,257.00	4,725.00	8,183,553,805.00	7,627,802,000.00	48,710,000,000.00	64,521,355,805.00
Total:		597	13,810.00	6,906.00	37,408,318,956.00	44,581,523,865.00	101,108,877,702.00	183,098,720,523.00

Total cost estimated about : 21,541,025.94 USD

Sources: DOI 2018

Measures for irrigation sustainable development

1. Initial solving measures

- DOI have sent some technicians work together with local staff and solved problems where got the impact.
- To **installed two moving pump sets** with trucks for solving the flood and drought problems.
- cooperated with DHM and all dams for floods risk mitigation especially flat land area.



Source : DOI/Lao PDR 2018

Long term measures

- DOI should cooperation with PAFOs recheck and make sure the numbers of irrigated area in some provinces that not clear for **water management** in dry and rainy seasons.
- To provide the small pump sets (**5-7 HP**) and use HD, PE and PVC pipes for damage places .
- also consider for critical measures concerning about rehabilitation the damaged irrigation systems from climate change last year in order to supply water for dry season and paddy field season and ensure enough rice and food for people in Laos in the future.



SDG 6 :

- by 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers and lakes.
- By 2030 ,improve water quality by reducing pollution,
- Substantially increase water-use efficiency across all sectors.
- Implement IWRM at all levels,
- Support and strengthen the participation of local communities in improving water management.

Conclusion

- According to two cyclones SON-TINH and BEBINCA lashed the middle and northern parts of Laos during July and August 2018, Laos got heavy impacts including flooding, flash floods and irrigation systems were damages, paddy fields, landslide, houses, people, animals and the environment
- Total initial cost for irrigation is estimated about :
21,541,025.94 USD

Recommendation

- According to agricultural strategy and Lao SDGs by 2020, 2025 and 2030 for enhancing of food security ,so it need to be improve water management and developed warning systems and irrigation systems.
- Lao government should consider or find more fund for rehabilitation and development irrigation systems in Laos as more as well.

**Thank you very much
for your attention**

